

COMPENSATING FOR LEAKAGE CURRENTS IN LOOP FILTER CAPACITORS IN PLLs AND THE LIKE

ABSTRACT OF THE DISCLOSURE

5 Circuitry compensates for adverse effects resulting from leakage currents in loop filter capacitors
for signal synthesizers, like PLLs. In one technique, leakage current in the loop filter's damping
capacitor is compensated by driving the voltage across a matching capacitor and generating current for
the damping capacitor based on current applied to the matching capacitor. In another technique, leakage
current in the loop filter's transconductor capacitor is compensated by digitally accumulating differences
10 between the damping capacitor voltage and a reference voltage, and then converting the accumulated
difference into a (voltage or current) signal applied to the transconductor capacitor. In addition, the loop
filter could have an analog transconductor path that generates a signal that is also applied to the
transconductance capacitor. By effectively compensating for capacitor leakage currents, signal
synthesizers of the present invention can be implemented using capacitors having thinner oxide gates,
15 thereby reducing the size of the capacitors.